

REMARKS

This amendment is being filed in response to the Office Action dated April 26, 2005. In that Action, the Examiner rejected Claims 1-21 under 35 U.S.C. §102(b) as being anticipated by Applicants' admitted prior art, and under 35 U.S.C. §102(e) as being anticipated by Sarrafzadeh.

With respect to Applicants' admitted prior art, Applicants would respectfully submit that the teachings of the Background section of the present application do not anticipate the present invention, because the admitted prior art does not include the combined use of different placement algorithms in a single hybrid placement technique. The Office Action refers generally to Applicants' Background section and to page 9, lines 28-29 of Applicants' specification. The text at page 9 states only that the conjugate gradient placement algorithm is known, and that the successive over-relaxation placement algorithm is known. The Background section likewise discusses the conjugate gradient (CG) and successive over-relaxation (SOR) placement algorithms. However, Applicants are not claiming the CG placement algorithm per se, nor are Applicants claiming the SOR placement algorithm per se. Rather, Applicants' claims very specifically recite the use of a first placement algorithm (such as CG) for a first placing step, and a second, different placement algorithm (such as SOR) for a second placing step, with an intervening step of partitioning the layout region. The Office Action fails to point out with any specificity how this hybrid method is taught by Applicants' admitted prior art. In setting forth this rejection, the Examiner has simply cut and pasted Applicants' broad claims in a conclusory fashion without any indication of how the corresponding steps are ostensibly taught in the Background. Applicants' challenge the Examiner to identify in detail where these three steps (placement with a first algorithm, partitioning, followed by placement with a second algorithm) are supposedly found in the admitted prior art. Since the admitted prior art does not teach these three elements in a single hybrid method, it cannot anticipate the present invention.

With respect to Sarrafzadeh, Applicants would further submit that this reference also does not anticipate the present invention because it similarly fails to teach a first placement step, followed by partitioning, followed by a second, different placement step. In making this

rejection, the Examiner states that the *first* placement algorithm of Applicants' claims corresponds "to the teaching of quadratic placement based on clustering using quadratic technique (GBFM)" (page 3 of the Office Action, lines 2-3), and then goes on to state that the *second* placement algorithm corresponds "to the teaching of quadratic placement based on clustering using quadratic technique (GBFM)" (page 3 of the Office Action, lines 9-10). This quoted language is the same in both instances. In other words, in identifying the supposed teachings of Sarrafzadeh that correspond to the claimed first and second placement algorithms, the Office Action refers to only ONE placement algorithm of Sarrafzadeh, namely, GBFM. The rejection is therefore clearly misplaced since a single placement algorithm (GBFM) cannot read on Applicants' claim language which recites TWO different placement algorithms.

The Office Action quotes this same language in referring to the partitioning step as well, but that language says absolutely nothing about actual partitioning. The Office Action refers to Figures 6, 8, 22 and 23, but these figures do not illustrate placement using a first method, followed by partitioning, followed by placement using a second method, and such a technique is likewise never discussed in columns 5-6 of Sarrafzadeh. The distinction based on the recited partitioning step may be understood by comparing Figure 23 of Sarrafzadeh to Applicants' Figure 3. Figure 23 of Sarrafzadeh shows four different phases of the placement process, but each phase has the same number of regions, viz., four. That is, the first illustration in Figure 23 shows a box that has been divided into four regions, the second illustration in Figure 23 shows a box that has the same four regions, the third illustration in Figure 23 shows a box that has the same four regions, and the fourth illustration in Figure 23 shows a box that still has the same four regions. In contrast, Applicants Figure 3 shows how partitioning is performed between the placement step using CG, and the placement step using SOR. The example of Applicants' Figure 3 illustrates CG acting on a layout that has four regions, followed by partitioning into sixteen regions, and the SOR placement is then performed on the layout having sixteen regions. Thus, Sarrafzadeh does not disclose "placing a portion of the logic cells in at least one of the partitioned regions using a second placement algorithm" as recited in Applicants' Claims 1, 8 and 15, and one skilled in the art would not understand Sarrafzadeh to refer to Applicants' inventive subject matter.

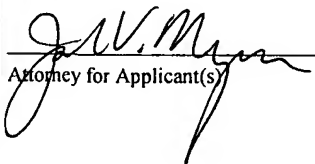
There are different advantages and disadvantages of various placement techniques. For example, CG is more computationally efficient than SOR, but CG takes more CPU time per iteration. Applicants' invention recognizes that different placement techniques can be used at different points in the partitioning process to optimize efficiency. CG is performed early in the process when the number of iterations is smaller, and SOR is performed later in the process where the CG algorithm would take too long. As noted at page 8, lines 16-19 of Applicants' specification, by applying the CG or SOR techniques in a *selective* manner to the same IC layout, a high-quality placement solution can be derived in much less time than would otherwise be required. The combined use of different, complementary placement techniques in this manner is not taught or suggested by Sarrafzadeh.

The foregoing arguments apply to Applicants' independent Claims 1, 8 and 15, as well as the dependent claims. With further regard to Claims 5, 12 and 19, the specific selection of CG as the first placement algorithm and SOR as the second placement algorithm is certainly not anticipated by Sarrafzadeh, since that reference makes absolutely no mention of either of these placement algorithms. In rejecting those claims, the Examiner simply uses the same unsound logic as before, that the CG and SOR algorithms somehow correspond "to the teaching of quadratic placement based on clustering using quadratic technique (GBFM)." The CG and SOR algorithms are very specific techniques which are separately known in the art and are set forth in detail in Applicants' specification (pages 9-10). The GBFM algorithm of Sarrafzadeh is not CG nor SOR, and Applicants would again challenge the Examiner to point out with specificity how Sarrafzadeh allegedly teaches CG and SOR. With further regard to Claims 6, 13 and 20, the Office Action argues that Sarrafzadeh teaches a third placement algorithm which is different from first and second placement algorithms, since successive placement refinements are performed on smaller sub-regions. That argument is defective, however, because regardless of the region size, the same placement algorithm is used in each case, viz., GBFM, contrary to the plain language of Claims 6, 13 and 20.


Since Sarrafzadeh does not teach each and every element of Applicants' claims, it accordingly cannot anticipate the present invention.

Notwithstanding the foregoing, Applicants have amended Claim 1 to incorporate the recitations of Claim 5, specifying that the first placement algorithm is CG, and the second placement algorithm is SOR. Similar amendments have been made to Claims 8 and 15. These amendments serve to further distinguish Applicants' invention from the cited reference. Claims 2-5, 7, 9-12, 14, 16-19 and 21 have accordingly been deleted, and Claims 6, 13 and 20 have been slightly amended for consistency. For all of the foregoing reasons, Applicants respectfully request reconsideration of the §102(b) and §102(e) rejections.

Applicants have made a diligent effort to advance the prosecution of this application by amending claims, deleting others, and pointing out with specificity how the claims as presented patentably define the invention over the prior art of record. In view of the amendments and remarks set forth herein, the application is believed to be in condition for allowance and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is requested to telephone the undersigned.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, Mail Stop Amendment, P.O. Box 1450, Alexandria, VA 22313-1450, on July 26, 2005.	
 Attorney for Applicant(s)	<u>July 26, 2005</u> Date of Signature

Respectfully submitted,


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